

SEWER MONITORING



APPLICATION BACKGROUND

Water and waste utilities need to monitor sewer levels and flows. If there are equipment breakdowns within the sewer system, overflows may occur. There are large fines and other penalties levied on water and waste utilities when there is a sewer overflow and the cost of cleanups is substantial.

Sewer overflow conditions can be detected with simple level limit switches, which may be installed within the sewer pipe at different levels, to trip a level limit alarm. Sewer flows can also be measured with the Unidata Starflow Ultrasonic Doppler flow meter installed on the bottom of the sewer pipe.

APPLICATION DETAIL

The overflow application is relatively simple. There could be a set of mechanical limit switches installed inside the sewer pipe, perhaps 3 switches at low, medium and high positions within the pipe, usually mounted on an angle bracket which is then inserted into the sewer pipe.

Each limit switch is wired back to the Neon Metering Logger which is set up to detect when the limit level is exceeded. The Neon Metering Logger alarm is activated and this alarm condition is sent to the Neon server via cellular, LoRa or satellite networks. The Neon Server processes the alarm and sends emails and / or text messages to alert operators of that out of limit and potential overflow condition.

Water and Waste utilities often need more sophisticated alarm handling, with multiple levels of escalation, such that if the first alarm was not acknowledged and attended to by the first person, within a pre-determined time, further alarms are sent to different escalation contacts, to make sure the potential overflow condition is being attended to.

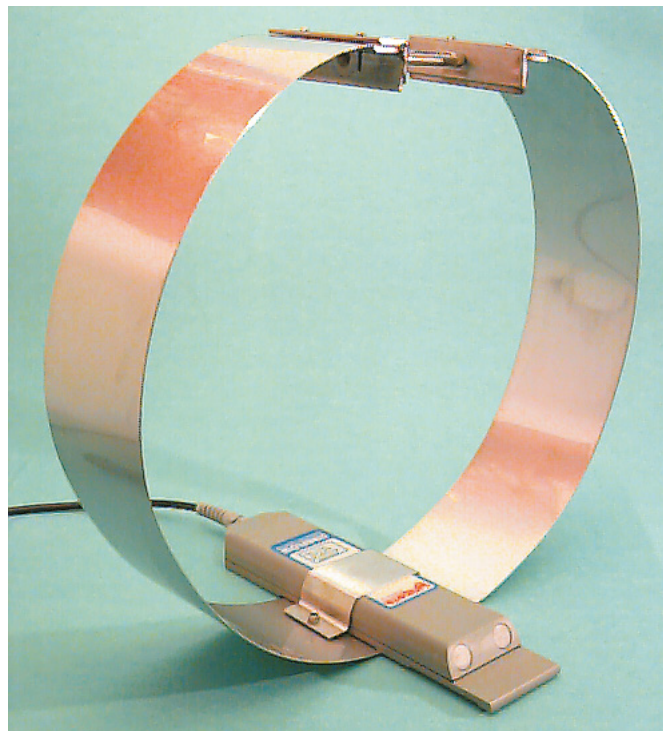
The M series Neon Metering Loggers are powered by a single lithium battery, and can operate for more than two years on that one lithium battery, so they are simple to install without the need for any power infrastructure. The industrial 3016 & 3008 models require a sealed lead acid battery and a solar panel.



A Neon Metering Logger can be wired up to a Unidata Starflow ultrasonic doppler flow meter to measure the velocity and the depth, and then calculate the flow reading based on the size and the shape of the pipe, which can be rectangular, circular or ovoid.

There may be a need to log routine levels and flows over a period, say over 24 hours, and then upload that routine data once per day at a predetermined time, e.g. at midnight to the Neon Server.

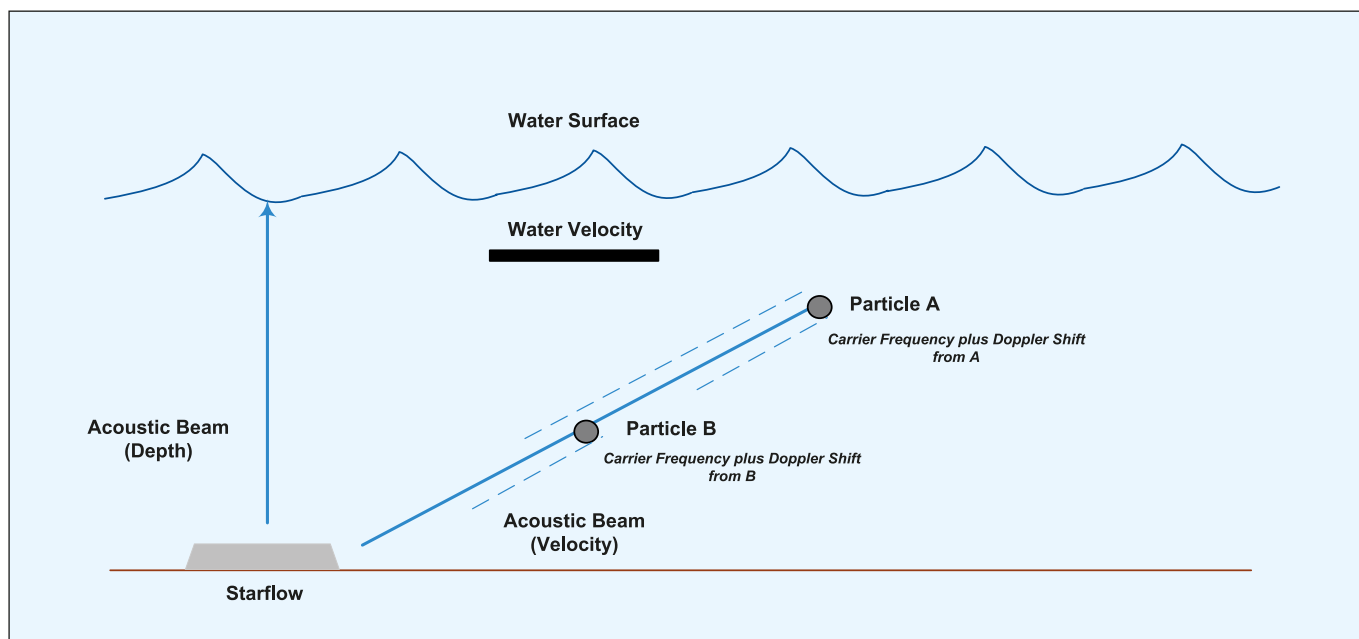




You should decide on an appropriate sensor reading interval, typically this would be to read the sensors every minute, and store the sensor data in memory every 5 minutes and send the sensor data to the Neon Server every few hours. To conserve battery life, equipment is set to sleep between sensor readings, however limit switch changes are detected immediately, even when the equipment is asleep. These limit switch changes trigger an immediate alarm transmission to the Neon Server and a text message can be sent to the relevant personnel to alert them of this alarm condition.

Another consideration is how to power the Neon Metering Logger. A power budget should be performed by Unidata engineers to decide the best power method, either solar panels and sealed lead acid battery system or lithium batteries.

In regard to mounting, the starflow instrument should be mounted inside the pipe using a pipe band or a mounting bracket. Care should be taken to make sure the installation is mechanically smooth, so any debris in the sewer flow is not caught on any sharp edges of the instrument, the mounting plate or the cable.



TYPICAL CONFIGURATION

APPLICATION SPECIFIC INSTRUMENTS / INPUTS

Options	Unidata Part Number	Description
Mechanical Limit Switches	Custom Part	Various Industrial Switches
Ultrasonic Doppler Instrument - velocity, depth & flow	6526J-21	Starflow Ultrasonic Doppler Instrument 0-2m
Ultrasonic Doppler SDI-12 Instrument - velocity & depth	6527A	Starflow QSD Ultrasonic Doppler SDI-12 Instrument

NEON TELEMETRY - NRL / RTU / FIELD UNITS

Options	Unidata Part Number	Description
Ethernet	3016A-000 / 3008A-000	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Ethernet & 3G / 4G	3016A-C00 / 3008A-C00	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Ethernet & 3G / 4G and LoRa	3016A-CL0 / 3008A-CL0	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Equatorial Orbit Satellite - Inmarsat	3016A-00I / 3008A-00I	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Equatorial Orbit Satellite - Inmarsat & 3G / 4G	3016A-C0I / 3008A-C0I	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Low Earth Orbit Satellite - Globalstar	3016A-00G / 3008A-00G	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Satellite - Iridium Short Burst Data	3016A-00R / 3008A-00R	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Standalone RTU / NRL - Industrial	3004A-00 / 3004A-0L	Neon Remote Logger-4 Analog Ch with or without Touch Screen Display
Cellular RTU / NRL 3G / 4G - Industrial	3004AC0 / 3004A-CL	Neon Remote Logger-4 Analog Ch with or without Touch Screen Display
M – Series Standalone RTU / NRL	3004B-M000 / 3004B-M0B0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series Cellular RTU / NRL 3G / 4G	3004B-MC00 / 3004B-MCB0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series LoRa RTU / NRL	3004B-ML00 / 3004B-MLB0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series Ethernet RTU / NRL	3004B-MEBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional
M – Series Microsatellite RTU / NRL	3004B-MHBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional
M – Series Iridium Short Burst Data RTU / NRL	3004B-MIBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional

NEON APPLICATION SOFTWARE - CUSTOMER SERVER

Options	Unidata Part Number	Description
Neon Applications Software	2302A	Neon Server Software Licence Incl 5 NAL
Neon Applications Software	2302A-10	Additional 10 NRT Access Licence
Neon Applications Software	2302A-20	Additional 20 NRT Access Licence
Neon Applications Software	2302A-50	Additional 50 NRT Access Licence

NEON HOSTING SERVICE - UNIDATA SERVER

Options	Unidata Part Number	Description
Neon Hosting Service	2301A	Neon Data Initial Subscription Setup Fee
Neon Hosting Service	2301A-01	Neon Data Service Fee for 1-50 NRT
Neon Hosting Service	2301A-02	Neon Data Service Fee for 51-100 NRT
Neon Hosting Service	2301A-10	Neon Data Service Fee Metering

DATALOGGER MANAGEMENT SOFTWARE

Options	Unidata Part Number	Description
Starlog V4 Management Software	6308A-AUE	STARLOG V4 Full Licence Key